## REMARKS/ARGUMENTS

Claims 1-44 are pending in the captioned application. Claims 30 and 36-44 have been withdrawn. Claims 1-29 and 31-35 are under examination and have been rejected. Applicants respectfully request reconsideration and allowance of the claims in view of the amendments and the following arguments.

Applicants have amended claim 1 to include the subject matter of the now cancelled claims 11, 12 and 14. Applicants have amended claim 31 to include the limitation of the now cancelled claim 32. Applicants have also amended claims 2, 5, 13, 19, 22, 23 and 29. Therefore claims 1-10, 13, 15-29, 31 and 33-35 are currently under examination. Applicants respectfully submit that these amendments are fairly based on the specification and do not introduce new matter.

Claims 1-29 and 31-35 stand rejected under 35 U.S.C. §112, first paragraph, as failing to provide an enabling disclosure. Applicants respectfully disagree.

In the Office action, the Examiner states that the application exemplifies mixtures of a single cationic detergent, CTAB, with high concentrations of an amide-modified oligonucleotide delivered to and binding with a surface modified with carboxymethyl groups and NHS. The Examiner further states that "Applicant assumes a critical micellar concentration (CMC) for the detergent, not the mixture, and provides no evidence that a vesicular structure was formed at the concentration of

detergent and oligonucleotides used in the conditions of the experiment". The Examiner uses Chatterjee et al. to show that the CMC for CTAB in the presence of various biomolecules can range from 2.59-5.56 mM, and thus exceeds many of the concentrations used by the applicants in the present application. Finally, the Examiner comments that it is "not known or in evidence whether binding to NHS disrupted in any way the association between oligonucleotides and CTAB in the mixture of applicant".

In response, Applicants first submit that the claims have been amended. Both claims 1 and 31 have been amended to better define the target molecule and capture agent, respectively. These claims are also amended to clarify that after target molecule (i.e., capture agent in claim 31) binding to the solid support, the detergents are removed from the solid support surface. Applicants submit that the amendments are fairly based the specification, including the original claims filed, and does not introduce new matter.

Applicants submit that Chatterjee et al. relates to studies of surfactant-biopolymer interaction. The biopolymers used there are gelatin, lyzozyme or calf thymus DNA, each having a large molecular weight. Applicants submit that the interactions between these large molecules and the cationic detergents cannot be properly compared with interactions of the low molecular weight compounds or oligonucleotides as described in the present invention.

Applicants submit that the CMC of a cationic detergent changes as the composition of the solution changes. For example, Chatterjee et al. teaches that lower concentrations of biopolymer should give lower CMC values, see page 320, column 2. In addition, the enclosed reference also shows that the CMC for CTAB can be much lower than that stated by Chatterjee et al. (Otto et al., Journal of Colloid and Interface Science, 261: 508-513 (2003); Table 1 shows CMC at 0.66 mM). Applicants assert that Chatterjee et al. studies large biomolecules, while the current application studies small molecules, thus it is not proper to assume that the CMC conditions for one would fit that of the other. Therefore, Applicants submit that the Examiner can not draw the conclusion that the concentration of CMC has to be as high in the current invention based on Chatterjee et al.

Applicants further submit that the specification describes more than what is summarized by the Examiner. Specifically, in addition to CTAB, the specification exemplifies DTAB as another cationic detergent in Example 4 and Table 4. Furthermore, Applicants submit that as the experimental data was obtained at around or above CMC, there is no question that vesicular structures are formed under these conditions, as defined in the specification.

With regard to the Examiner's comment that it is not know whether binding to NHS disrupted in any way the association between oligonucleotides and CTAB in the

mixture, Applicants submit that this is discussed in the specification, see page 10, line 27 through page 11, line 5. Applicants submit that once the oligonucleotides bind to NHS it is irrelevant whether a disruption of the complex occurs. Subsequent washing steps (e.g. high salt, high pH) will remove the vesicular structure or detergent residues.

Applicants respectfully submit that the 35 U.S.C. §112, first paragraph rejection of the claims as failing to provide an enabling disclosure should be withdrawn.

Claims 2, 5, 11-13, 19-23 and 29 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In response, Applicants have amended claims 2, 5, 11, 19, 22, 23 and 29. Applicants submit that the amendments do not introduce new matter. Support for the amendment to claim 19 can be found on page 15, lines 21-23. Support for the amendment to claim 29 can be found on page 14, lines 22-29. Applicants respectfully submit that the indefinite rejections of the claims should now be withdrawn.

Claims 1-7, 9, 10, 15, 18-21, 25-29, 31 and 35 stand rejected under 35 U.S.C. §102(b) as being anticipated by Karlsson et al. (Anal. Biochem. 300: 132, 2002). Applicants respectfully disagree. However, in an effort to expedite prosecution, Applicants have amended claim 1 to incorporate the subject matter of claims 11, 12

and 14, therefore rendering moot the rejection of claim 1 and the dependent claims thereof. Similarly, claim 31 have been amended to incorporate the limitation of claim 32, rendering moot the rejection of claim 31 and the dependent claims thereof.

Claims 1, 4-11, 16, 26, 31 and 33-35 stand rejected under 35 USC 102(b) as being anticipated by Czerkinsky et al. (J. Immunol. Meth. 65: 109, 1983). Applicants respectfully disagree. However, in an effort to expedite prosecution, Applicants have amended claim 1 to incorporate the subject matter of claims 11, 12 and 14, therefore rendering moot the rejection of claim 1 and the dependent claims thereof. Similarly, claim 31 have been amended to incorporate the limitation of claim 32, rendering moot the rejection of claim 31 and the dependent claims thereof.

Claims 1-15, 24, 26, 31-35 stand rejected under 35 U.S.C. §102(b) as being anticipated by or, under §103(a) as obvious over, Nikiforov et al. (US 5,610,287). Applicants respectfully disagree.

Applicants submit that the Nikiforov et al. reference does not teach, or render obvious the claimed invention. In fact, Nikiforov et al. specifically teaches away from the invention. Although Nikiforov et al. uses CTAB to improve the binding of oligonucleotides to polystyrene surfaces, it specifically points out that micelles must be avoided, see, e.g., column 7, lines 10-26. Nikiforov et al. states that CTAB can be used at very low concentrations (e.g., 0.03 mM), but emphasizes that CTAB inhibits

immobilization of oligonucleotides when used at higher concentrations. Nikiforov et al. goes on and states that at concentration as low as 0.5 mM, CTAB inhibits immobilization of oligonucleotides. Earlier in the same reference, Nikiforov et al. also states that the concentration of CTAB should be between 0.03 mM to about 0.25 mM (column 5, line 20-22), which is lower than the concentration used in the current application (see Table 3, where lowest working CTAB concentration is 0.4 mM). Applicants submit that it is clear from the disclosure of Nikiforov et al. that it does not anticipate or render obvious the current claims of the invention.

Applicants note that Nikiforov et al. mentions the CMC for CTAB is about 1 mM (column 7, line 25). However, Applicants submit that as discussed earlier in this response, the CMC of a cationic detergent changes as the composition of the solution changes. For example, Otto et al. shows that the CMC for CTAB is as low as about 0.66 mM in their system. (Otto et al., Journal of Colloid and Interface Science, 261:508-513 (2003); Table 1).

Applicants submit that the binding in Nikiforov et al. is based on a different mechanism, namely that the complex of CTAB and oligonucleotides is made more hydrophobic and in this way better adsorbed to the polymer surface via mainly hydrophobic interactions. In the current application, Applicants have shown that the coupling is not very sensitive to CTAB concentration and in fact functions well over a shown concentration range from 0.4 to 4.5 mM (Table 3), i.e. well over

the CMC value for CTAB. Furthermore, the present methods work on strongly negatively charged surfaces where it is not likely that any hydrophobic effects are significant.

Applicants submit that the claim rejections based on Nikiforov et al. could not be sustained and should be withdrawn.

Applicants respectfully assert that the claims are in allowable form and earnestly solicit the allowance of the claims 1-10, 13, 15-29, 31 and 33-35.

Early and favorable consideration is respectfully requested.

Respectfully submitted,

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